The Cornell Countryman

VOL. 5 OCTOBER, 1907 NO. 1

A FEW WORDS FROM PRESIDENT SCHURMAN

RECENTLY I spent some pleasant hours with a young man whose family for nearly three hundred years have occupied the same farm in the State of New York. It is a farm of some 4,000 acres, part moorland, part devoted to crops, but the largest portion in grass which supports a stable of thorough-bred horses, a goodly herd of cattle, and immense flocks of sheep. The "labor problem" has been settled by bringing negroes from the country districts of the South and allowing most of them, when the cold weather comes to go home, where they deposit or display and spend their wealth during our winter months, after which they again return to the rural scene of their Northern labor and prosperity. The picture painted by the young man was a very attractive one; he obviously joyed in the life they led and the work they wrought; and he looked forward with pride to making improvements in the estate when in the course of time it should come into his own hands. He was no city "agriculturist"; his family had been and were actual farmers; he was proud of the name and calling, though it was no longer necessary for him to make his livelihood by manual labor.

Clearly the case is different from the case of the hardworking farmers of our State. Nevertheless it has suggestions of value. This young man loved the country and desired to spend his days there, and he was loyally attached to the spot where a dozen ancestors had lived and died. Here is something to admire and imitate at a time when so many of our people are given to wandering and the country is being drained of its youth for the benefit of the city. This case shows too that the farms of New York are not exhausted though they have been cultivated five or ten times as long as the richest portions of the Western prairies. And the methods of farming practised on this farm may explain why the soil is still productive: there has been diversification of agriculture, and diversification, according to the best authorities, is the hope of the agriculture of New York at the present time. Two other factors have made this farm a success. One is the adaptation of products to the excellent markets with which our State abounds; the other—the supreme factor—is the owner's industry, knowledge, skill, and organizing and executive ability.

Can the factors requisite to success in farming be communicated to students by school or college? Brains are the gift of nature. Character is the individual's own creation. No college of agriculture can make an effective farmer out of a silly or vicious boy. But the country is a good place to be born in and to grow up in, and the farmers' boys are above the average in intellectual endowments and in moral stamina. Such boys can indeed obtain much in an agricultural college to aid them in their farming. Above all they can acquire that knowledge, accurate and comprehensive, which we therefore call scientific, of the soil and its constitu-

PHOTO BY GILMORE JULY 27, 1907

ents and of the best methods of cultivation and of plants and animals and the best manner of breeding and using them, which form the fundamental conceptions and operations of agriculture. The prospective farmer has his intellectual horizon enlarged by a course in an agricultural college; his mind is vitalized by new ideas; and these new ideas are not about the sun, stars, or other remote objects, but about the very objects, operations, and practices out of which as a farmer he is to extract a livelihood. His training is as scientific as physics or chemistry and, in its outlook and application, as practical as crop-raising, cheese-making, or poultry-keeping. The savage goes by rule of thumb; the American farmer of the Twentieth Century must walk by the light of agricultural science. The rule of thumb may still suffice for the virgin prairies of Dakota or Saskatchewan; but the old farms of New York are to be rejuvenated and enriched by the energy of applied science. Knowledge is power, said Lord Bacon: nowhere today can it be more powerful than on the farms.

Cornell University is devoted to both theoretical and practical knowledge. That is why it has always had a department or college of agriculture. Whether from the point of view of knowledge itself or from the point of view of service to the people of the State, no college is better entitled to a place in the University. None has been more anxiously watched by the authorities of the University. Unfortunately they were always hampered by lack of funds, for agricultural education is the costliest of all education. In my Inaugural Address as President, I advocated the policy of State support for the Colleges of Agriculture and Veterinary Medicine. Up to that time New York had never contributed a cent from the treasury of the State to the College of Agriculture or any other College of the University. My policy commended itself to the people. Within a year the State built and equipped a Dairy Department. Then followed the State

College of Veterinary Medicine with its annual appropriation for maintenance. Then came the buildings of the College of Agriculture, followed by its organization as a State College with an annual appropriation for its maintenance, which for this year amounts to $150,000 of regular income and $75,000 for special objects.

The State has generously carried out the policy which the University had outlined for it. That policy is for the benefit of the people, not for the aggrandizement of the University. And the people all over the State now expect great things of the College of Agriculture. I feel deeply that Cornell University has had a great responsibility put upon it. For the control and management of the State College of Agriculture devolve as completely upon Cornell University as the control and management of any other College on the Campus. But my anxiety is relieved when I reflect that the College of Agriculture has been given, by the Trustees of the University, the same organization which has worked so successfully in the other Colleges of the University, and, especially, when I recall the zeal, devotion, and high ability of the Director and Faculty of the College. The highest ambition of these men is to acquire agricultural knowledge, to communicate it to the young men and women who come here, to diffuse it by extension and other methods throughout the State, to elevate and improve the agriculture of the State, and to make the farmer's work more productive, more intelligent, and (may we not hope?) more joyous and inspiring.

AGRICULTURE FOR HIGH SCHOOLS

By G. F. Warren.

Assistant Professor of Agronomy.

THE outlook for the introduction of agriculture,—During the last session of Congress, a bill was introduced by C. R. Davis of Minnesota providing that 10 cents per capita of the population of each state and territory shall be furnished by the national government to aid in teaching agriculture and domestic science in rural high schools and mechanic arts and domestic science in city high schools. It provides that the funds shall not go to aid in the support of more than one school in each county and that the school shall furnish buildings, and instruction in other subjects that are necessary for a well rounded high school course. In a recent letter, Mr. Davis says that the aim is to extend the benefits of the Land Grant Act to all the people.

Whether the bill will pass is a question, but it is arousing serious discussion not only because of the far reaching results that would follow such an action, but because it calls for an annual appropriation of eight millions of dollars. It would also lead to even larger expenditures by the states.

Within the last few years there has been a remarkable growth of interest in agricultural education. Ten states now require their teachers to pass examinations in elementary agriculture, and ten states require the subject to be taught in rural schools below the high school. Less has been done in high schools, but there is now a strong movement for the introduction of the subject therein. Alabama has established an agricultural high school in each congressional district. A year ago the Georgia legislature started an annual appropriation of $6000 for aid in maintaining a high school in each congressional district. The people of the state responded by private subscription with over a hundred times this amount for equipment.

It is only within the last ten or

twenty years that enough real scientific knowledge of the principles of agriculture has been put into pedagogic form so that any vital teaching of the subject could be given even in colleges. But now a quite well organized system of college education is established. The next step is to extend this training to high schools. The rural schools will best be reached by training the rural school teachers while they are students in the high school.

Agriculture in the regular high schools.—To accomplish this purpose, agriculture should be taught in high schools just as algebra is taught except that agriculture should be an elective.

To those who are not familiar with the nature of agricultural teaching it may seem like a trade subject, but it is much more than a trade subject. *The study of agriculture gives the same educational development as that given by the study of botany, chemistry and other sciences. It merely selects from the infinite number of subjects for scientific study, those that are concerned with the growth of plants and animals that are useful to man.*

Only about half of our population are engaged in agricultural work. But the interest in agriculture includes nearly all the population. A very large part of our city population, particularly of the larger cities, is coming to take the keenest interest in agricultural questions. The number of agricultural inquiries that have come to the Cornell Experiment Station from New York City within the past few years is very remarkable, but no more so than the movement for the ownership and management of farms by city men. Nearly every one is interested in growing plants and animals, and there are some fundamental principles of this growth that every boy and girl should have an opportunity to learn, if they so desire. Not that they may become farmers or farmers' wives, but for the educational training and intelligent interest in life that this knowledge brings. This training is often as desirable for those who are to live in cities as for those who are to live on farms. We can never wholly separate our interests from the soil on which we walk and the plants and animals on which our life depends.

It is not desirable that a teacher try to make farmers of farmers' sons or lawyers of lawyers' sons. The thing that distinguishes America from the Old World is the mobility of its society. Each man may do what he likes and become what his energy will make him. While it is not desirable to make farmers, it does seem desirable to stop unmaking them. The present trend of all our education is cityward. We have been living in a city making epoch. The bright farm boy as he has attended the village high school has been taught much that would naturally interest him in city occupations. The teacher has become interested in him and encouraged him to "make something of himself." This usually means that he become a lawyer, doctor, or perhaps an engineer. The nature of his books and the advice of his friends have led him to believe that these were the lines in which mental ability would bring the greatest returns. If he did become a farmer he frequently felt that by doing so he lost his real opportunities. In the past this may have been so: but to-day, law, medicine and the ministry are not the only learned professions. The practice of agriculture now offers as great a field for scientific study as is offered by the practice of medicine. The study of agriculture is one of the best subjects for producing citizens that are mentally alert, industrially efficient and morally sound.

The teaching of agriculture will make more farmers who will make more money. It will lead more boys to choose farming as a profession, because it will open up a field for intellectual life whose existence they never suspected. But the great reason for this work is that it is one of the best means of training a student's mind, and it is one of the best means because it studies the things that

come within his experience,—the things with which and by which he lives.

Shortage of prepared teachers.—At present the greatest obstacle to introducing the subject is not the lack of desire on the part of school authorities, but lack of knowledge as to just how to go about it. Few high schools can secure graduates of agricultural colleges, because such graduates are so few in number and because they cannot be secured at the same wages that are paid to other high school teachers.

The Pennsylvania State College has a plan that promises to bring good results. It is proposed to offer a teachers' course in agriculture next summer. The idea being to teach a year's agriculture in six weeks just as Cornell and other summer schools now teach a year's French in six weeks. And just as in the case of the French, the student will study nothing but agriculture during the six weeks. Very little good would come from a six weeks study if other studies were taken. The idea is not to make trained agriculturists but to teach teachers to teach a syllabus of agriculture. After such a course a teacher will be able to start instruction in agriculture and carry it on successfully when provided with a good set of laboratory and recitation directions.

Before taking up such a course, a teacher should have a good knowledge of high school botany and chemistry and as many other sciences as possible.

It is also extremely desirable that one who proposes to give good solid instruction of a high school grade should have experience in doing farm work.

The place of agriculture in the high school course.—Agriculture may be placed in the high school course as an elective after the class has studied botany, chemistry and as much other science as can be arranged for. The following suggested courses for high schools are given to show a few of the many ways in which agriculture might be arranged for without greatly modifying the present courses. It is not the writer's intention to indicate what the entire high school course should be, but to indicate the minimum changes that are necessary in order to include agriculture in courses that are now commonly given. With a larger teaching force it is an easy matter to make courses that are less alike and that will, therefore, probably be better suited to each purpose. The language courses here included are about such as are given in many high schools in the United States.

High School Course for Schools having three Teachers.

Language	Agriculture
FIRST YEAR	
English Latin or modern language Algebra Biology (botany and some zoology)	same
SECOND YEAR	
Latin or modern language History Algebra and Plane Geometry Chemistry	same
THIRD YEAR	
English Physics or Solid Geometry Civics (½) Bookkeeping (½)	same
Latin or modern language	Agriculture

High School with Four Teachers

Language	Agriculture
FIRST YEAR	
English Latin or modern Language Algebra Zoology (½), Physical Geography (½)	same
SECOND YEAR	
Latin or modern Language History Algebra and Plane Geometry Botany	same

THIRD YEAR

Latin or modern language, Geometry, Chemistry — same
Language (ancient or modern) — Agriculture

FOURTH YEAR

Latin or modern language, English, Physics — same
Language (ancient or modern) — Civics (½)
Bookkeeping (½)

The language course as here suggested if well taught will admit to some courses in nearly any college in the United States. To include the agriculture in such a high school requires the addition of but one or two classes. This amount of work is commonly given by high schools with four teachers, and sometimes by those with three teachers, but it is very doubtful if three teachers should attempt more than the three year cours.e

If more classes could be taught, the agricultural students might be given commercial geography (½) and physiology (½) in place of language in the fourth year. If it is desired to give less science, biology might be given in place of zoology, physical geography and botany. This would place chemistry in the second year and allow some additional study in the third year. In some parts of the country less language is given than in this course, but such a condition does not influence the ease with which agriculture can be introduced into the high school course.

High schools with more than four teachers will probably have no difficulty in introducing agriculture. Such a school can teach enough subjects so as to offer as many different courses as seems best.

High schools wishing to offer a strong agricultural course. Such a school will usually offer other courses, only the agricultural course is here suggested.

FIRST YEAR

English
Latin or modern language
Algebra
Zoology (½ year), Physical Geography (½)

SECOND YEAR

Latin or modern language
History
Algebra and Geometry
Botany

THIRD YEAR

English
Geometry
Chemistry
Agriculture (plant industry)

FOURTH YEAR

Civics (½), bookkeeping and business forms (½)
Commercial geography (½), physiology of man and of domestic animals (½)
Physics
Agriculture (animal industry)

It will be seen that any of these courses give a fairly general education. The laboratory work in science and agriculture furnishes much practice in drawing and English. It has been said that a liberal high school or college education should include studies from each of the following groups: English, language other than English, history, mathematics, natural science. If this is true, then any of these courses would satisfy the definition.

FARM PRACTICE

By J. L. Stone

Professor of Farm Practice

ATTENTION is called to the second paragraph on page 21 of the new Program of Courses of Instruction of the College of Agriculture, which reads, "No degree will be given until the student has satis-

fied the college of his knowledge of farm practice;" Also to course 19 on page 34, "Farm Practice. An elective course especially designed for students who are not familiar with ordinary farm methods and practices. Throughout the year. Not given for University credit, but to assist students in meeting the requirements of farm practice demanded by the College."

Our college is somewhat unique among agricultural colleges in its number of students who have not been raised on farms. These students are usually ignorant of the common things of the farm with which those reared on farms are quite familiar, The knowledge of these common things is as essential to successful farming as arithmetic. Neither, however, are subjects of university grade and the time spent in acquiring them should not count towards graduation. They are, rather, entrance requirements; only in the case of the farm practice the student who is so unforunate as to come to us without it is permitted and required to secure a certain minimum amount during his course.

To have satisfied the requirements of the Farm Practice Department the student must, before leaving the University, secure not less than 60 points as scheduled below. Ample experience in the lines mentioned will secure the full credit assigned, partial experience a less number.

1. Experience in harnessing, hitching and driving horses---------- 10.
2. Experience in plowing and harrowing land and cultivating crops 10.
3. Experience in planting crops (drills, seeders, etc.)---------- 10.
4. Experience in harvesting crops (mower, harvester, corn binder, potato digger, etc.) ---------- 10.
5. Experience in running threshing machinery 4, ensilage cutter 3, wood saw 2, feed mill 1,------ 10.
6. Experience in orchard and fruit yard work---------- 10.
7. Experience in trucking and market garden work---------- 10.
8. Experience in milking and caring for cows---------- 10.

PHOTO BY S. FRASER

A FAMILIAR SCENE

9. Experience in the manufacture of butter and cheese---------- 10.
10. Experience in managing and caring for a flock of sheep------- 10.
11. Experience in managing and caring for a herd of swine------- '10.
12. Experience in managing and caring for a flock of poultry----- 10.
13. Experience in any other definite line of Agriculture--------- 10.

Students taking the practice work offered by the Department of Animal Husbandry, Dairy Industry, Horticulture or Poultry Husbandry will have their credits in these departments raised to 10 if they make an average grade of 80 or more--less if they fall below this grade.

Opportunity will be given on the College farm so far as conditions permit to gain farm practice credits in 1, 2, 3, 4 and 5 but University credits may not be secured by such work.

It is expected that students coming from farm homes will be able to meet these requirements, but those not having had farm experience will need the work given here and it is hoped that the requirements will compel them to do actual farm work on some well managed farm during at least two summer vacations.

ADJUSTING A CROPPING SYSTEM FOR A MAXIMUM HERD

By W. J. Spillman

Agrostologist, U. S. Dept. of Agriculture

IT is seldom that a single fixed rotation will produce feed in a proportion that can be utilized to advantage on the dairy farm. It will be seen in the problem below that two rotations are required to accomplish the purpose sought, and this is usually the case on dairy farms. The various systems of feeding dairy cows may be roughly classified in five groups, characterized as follows: (1) pasture in summer, dry roughage in winter; (2) pasture in summer, hay and silage in winter; (3) soiling in summer, dry roughage in winter; (4) soiling in summer, hay and silage in winter; (5) silage and hay the year round. Root crops may, of course, be substituted for silage in any of these systems where silage is used.

Roughly speaking, 60 acres of land devoted to raising feed for the cows, when roughage only is raised, will maintain, under each of these five systems and with the ordinary cropping systems of the Northern States, approximately the following sized herds: No. 1, 13; No. 2, 13; No. 3, 18; No. 4, 18 or 19; No. 5, 20. It will be seen that by cutting out the pasture it is possible to increase the herd about 50%. It is assumed that the pastures are rich enough so that two acres will carry a cow, with a small amount of soiling corn, for five months during the summer.

In comparing these various systems of feeding I have calculated standard rations for each period of the year for all the kinds of stock kept on the farm. From these rations the quantity of each of the different kinds of feed has been calculated. Then cropping systems have been arranged in such a manner, with certain yields assumed, as to provide exactly the amount of feed needed for the herd. In ascertaining the acreage of each of the crops, I found it necessary to develop an algebraic method, which has been exceedingly useful to me in comparing different systems of feeding and different systems of cropping, and I give below one of the problems to show the method. The yields assumed are as follows: Soiling corn, 7 tons per acre; silage, 9 tons per acre; hay, 2 tons per acre; corn, 45 bushels per acre (= 1.26 tons); oats, 40 bushels per acre (= .64 tons) It is assumed that two acres of pasture will carry one cow during the summer, with

some soiling corn the latter part of summer, that a yearling will require one acre of pasture, and a calf half an acre.

TABLE I.

	1 cow & corresponding young	1 bull & 3 horses
Pasture, acres,	2.375	2.000
Soiling corn, acres,	.066	.066
Silage, acres,	.336	.294
Hay, acres,	1.085	4.905
Grain, tons,	.650	3.880

Let x equal the number of cows. It is assumed that the number of young stock is equal to half the number of cows and that one bull and three horses are to be provided for. The first column of figures in the above table shows the acreage needed for one cow and the corresponding young, the last column the acreage needed for one bull and three horses. The grain is given in the above table in tons, because the two crops, corn and oats, which are grown for grain do not yield the same amount per acre. From the above table we are able to express the acreage of some of the crops as follows:

a	Pasture,	2.375x + 2.000
b	Soiling corn,	.066x + .066
c	Silage,	.336x + .294
d	Oats,	.402x + .360
e	Timothy & clover,	.402x + .360
f	Timothy & clover,	.402x + .360

The area of oats is the sum of the areas of soiling corn and silage. The corn, oats, timothy, and clover above form a four-year rotation. Since oats yield .64 of a ton of grain per acre, if we multiply the expression for the acreage in the above rotation by .64, we get the tons of oats produced on that field. This gives .257x + .230 tons. The total grain needed (Table I.) is .650x + 3.880. Substracting the tons of oats from the total amount of grain needed we have .393x + 3.650 tons of grain to be grown in the next rotation. As each acre of corn grown for grain in the next rotation is to be followed by an acre of oats grown for grain, and as an acre of corn and an acre of oats together yield 1.9 tons of grain, if we divide the .393x + 3.650 by 1.9, we get the number of acres of corn followed by oats required to produce the additional grain needed. This gives .196x + 1.920 acres. We start the next rotation, therefore, with corn 1.96x + 1.920 acres. Now I have found by trial that along with the corn I must grow some hay in order to have enough hay, so that in the same field with the corn I insert peas and oats. The corn is to be followed by oats for grain, and that by timothy and clover for one year. The peas and oats are to be followed by timothy and clover for two years. The general form of this rotation is:

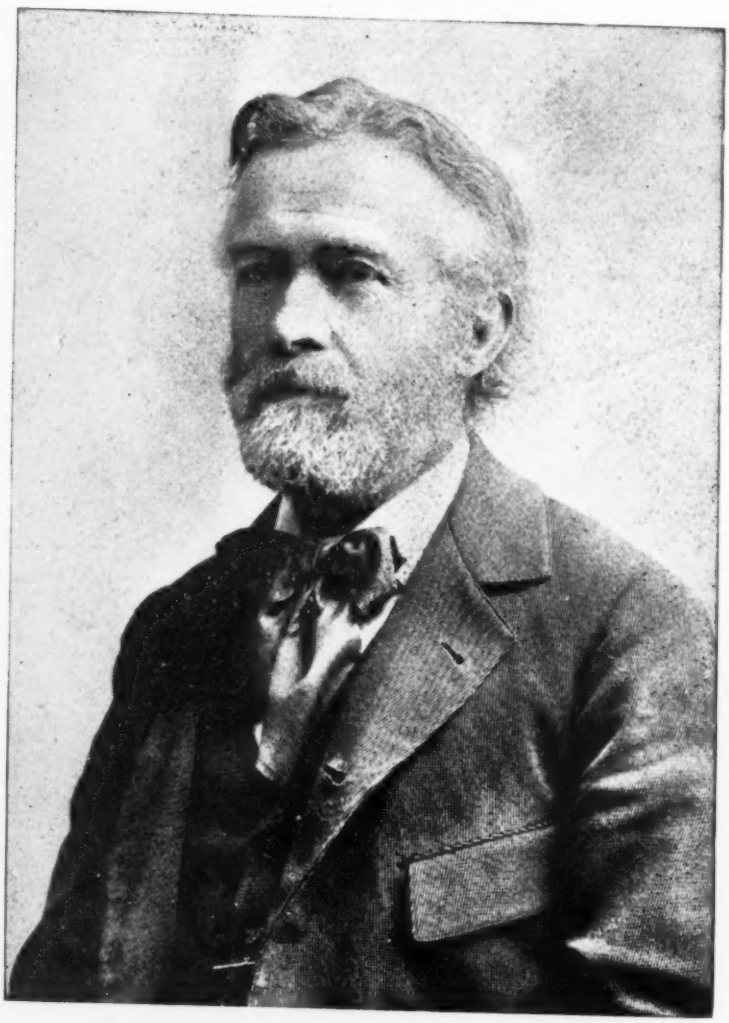
1	g Corn for grain,	.196x + 1.920
	h Peas and oats,	
2	i Oats for grain,	.196x + 1.920
	j Timothy & clover	
3.	k Timothy & clover	

The combined area of fields e and f above is .804x + .720. The total area of hay from Table I. is 1.085x + 4.905. The difference between these, .281x + 4.185, is the combined area of h, j; and k; or since h is equal to j, this combined area equals 2h + k. Now g + h = k. Substituting this value of k in the expression above, we have 3h + g = .281x + 4.185. Subtracting g, = .196x + 1.920, we have 3h = .085x + 2.265, from which h = .028x + .755, which also equals j. k = i + j, or .224x + 2.695. The second rotation may therefore be expressed as follows:

TABLE II.

1	g	Corn for grain	.196x + 1.920
	h	Peas and oats	.028x + .775
2	i	Oats	.196x + 1.920
	j	Timothy & clover.	.028x + .775
3	k	Timothy & clover.	.224x + 2.695
			4.655x + 11.525

We now have algebraic expressions for the area of each sub-division of the farm. Adding these together and placing the sum equal to 60 acres, we have 4.655x + 11.525 = 60, from which x = 10.4. This means that a farm of 60 acres will support 10 cows, 5 head of young stock, 1 bull, and 3 horses, furnishing both grain and roughage for the herd. By substituting 10.4 for x in the expressions for the areas of the various fields, we get the actual acreages.



COURTESY OF ALUMNI NEWS

GEORGE CHAPMAN CALDWELL

By T. F. Crane
Dean of the University Faculty.

ON Thursday, September 5th, died George Chapman Caldwell, emeritus professor of chemistry, and senior professor of the Faculty of Cornell University. Professor Caldwell was a man notable in many ways and his death deserves particular mention in this journal, representing as it does interests especially dear to him who has just passed away.

After his election in 1866 to the presidency of Cornell University, Mr. Andrew D. White visited various institutions of the West in the search for professors of the new faculty and found at Antioch College, Ohio, two men who were afterwards appointed to chairs at Cornell. These men had been trained in the traditions of Horace Mann, president of Antioch from 1852 to 1859, and had taught in an institution where freedom of thought was a fundamental principle.

One of these men was George Chapman Caldwell, born at Framingham, Mass., in 1834, and educated at the Lawrence Scientific School of Harvard University where he received the degree of B. S. in 1855. After graduation Professor Caldwell studied at the University of Göttingen where he took the degree of Ph. D. in 1857, being among the first to pursue serious scientific studies in Germany. After his return to this country he was appointed professor of chemistry at Antioch, where he remained until 1867 when he received an appointment in the Agricultural College of Pennsylvania, and shortly after one in Cornell University, where he took up his labors in the fall of 1868. It will be seen that he was unusually well equipped for his chair and had had much experience in teaching. His eminent scientific attainments gave dignity at once to the side of Agricultural Chemistry which his text books and lectures widely promoted.

When the University opened in 1868 the entire chemical laboratory was contained in the basement of the middle section of Morrill Hall. The following year a wooden building near where the north end of Goldwin Smith Hall now stands was erected and for a long time housed the departments of chemistry, physics, civil engineering and veterinary science. Professor Caldwell lived to see the erection of Franklin Hall in 1883 which chemistry shared with physics until 1890, when the extensive Morse Hall was constructed to be doubled in size by the addition of the north wing in 1900. These material figures show the enormous impulse given to the study of chemistry by Professor Caldwell and his able staff, and the huge building is his worthy monument.

But I cannot dwell on his scientific attainments, but must hasten to speak of his other services to the University. He was assiduous in the performance of his duties as a member of the faculty, from the first meeting one October afternoon in 1868 in a dark little room next to the Western Union Telegraph office in the Cornell Library, to the meetings held in Cascadilla Place and later in Morrill and Boardman Halls. From 1872 to 1886 he was the secretary of the General Faculty and kept the extensive minutes in his own neat handwriting. A correction of his minutes was a rare thing.

He was equally conscientious in all his other duties, as teacher and citizen. He was first of all a scholar and tireless in his devotion to his chosen profession, and the country is his debtor for a host of professors and investigators who are increasing its resources and expanding its intellectual horizon.

As a man Professor Caldwell commanded the affection and respect of all who knew him. He was modest and retiring, but ever ready to take his part in academic or civic reforms. He had inherited the best traditions of New England simplicity of life and

noble ideals in church and state and exemplified them in his spotless life and unwearied professional labors. He was a deeply religious man and a devout and active member of the Unitarian Church, in which communion he had been reared.

His health began to fail in 1892 and in November of that year he resigned his active work and was made emeritus professor, with grateful appreciation of his services from trustees and colleagues. As long as the university lasts his memory will be cherished as a profound scholar, a devoted teacher and an upright man.

THE DEPARTMENT OF EXPERIMENTAL PLANT BIOLOGY

By Herbert J. Webber

Professor of Experimental Plant Biology.

THE Department of Experimental Plant Biology was organized but a few months ago, as a result of Director Bailey's idea of separating the experimental from the teaching departments in the College of Agriculture. The primary work of the Department is thus expected to be experimental. The general policy in all Agricultural Colleges and stations as heretofore organized has been to combine the teaching and experimental works in the same departments. Experience has shown that in this plan of organization it is common for the experimental work to suffer, as the teaching cannot be put off while if the experimental work is neglected there is no visible loss and disorganization. Again in colleges, departments are largely judged by the number of students they attract. A department being considered strong and successful in general only when it is instructing a large number of students.

Director Bailey's plan of segregating the experimental and teaching departments would thus seem to be a wise provision in an institution having the combined functions of teaching and advancing knowledge by experimentation. By this provision it is not expected that the teaching departments shall not conduct investigations or that the experimental departments shall not give instruction to some students, but the primary functions of the two grades of departments are distinctly different. The experimental departments are expected to give instruction to only a limited number of graduate students who are prepared to carry out investigations under direction and whose study will thus aid in advancing the investigations under way. Following the plan above outlined the Department of Plant Biology will thus expect to have a limited number of graduate students working on special problems for advanced degrees but the number of such students must necessarily be very limited.

The investigations of the department will be limited mainly to studies of the fundamental problems of plant breeding, which necessarily includes careful studies of heredity and evolution. From the standpoint of popularity it would be desirable to create new and startling things by the juggling of characters through hybridization, but the department officials conceive that it is a higher aim to strive to advance our knowledge of the principles. While the discovery of Mendel's principles of heredity are understood and appreciated by only a limited number of students, they are of infinitely more value to the world than the production of any new variety however novel, could ever be. Mendel's principles of heredity are as yet imperfectly understood and investigations will be prosecuted with the view of extending our knowledge of these principles and their ap-

TIMOTHY PROGENY PLOT 842 SHOWING GREATER VIGOR AND YIELD THAN ADJOINING PLOTS

plication in practical plant breeding.

The possibility of improving plants by breeding, lies in the fact that plants are never uniform but always more or less variable. The study of the different types of variation and their importance to the breeder is thus of great value and will form one of the most important lines of investigation prosecuted by the Department. DeVries' theory of the origin of species and varieties by large type variations or mutations requires extensive experimental study and confirmation. Material is being collected for a thorough study of mutations and the investigation will be prosecuted as rapidly as possible. Up to the present time breeders have been compelled to await the appearance of variations as they are formed in the course of natural development. There is some evidence to indicate that such variation may be stimulated by artificial means and it is expected that investigations of this nature will also be undertaken as soon as facilities can be provided. It is expected that the studies of all hybrids and mutations will be conducted from a cytological standpoint also in order, if possible, to obtain further light on the mechanism of hereditary transmission of characters.

Certain experiments of more direct practical nature will also be undertaken and some are already under way. The most noteworthy of these is an extensive experiment in the improvement of timothy. This experiment was started in 1902 by Professors Hunt and Gilmore of the old Department of Agronomy, and was placed under the writer's charge in the Department of Plant Biology following the retirement of Professors Hunt and Gilmore from the College of Agriculture. These experiments in the past have been carried on with the assistance of Mr. Fraser and Mr. Clark, and the latter remains with us to assist in the work.

New York ranks first among the states in the production of hay crops, with a yield in 1906 of 6,038,580 tons valued at $73,066,818. While first

in total yield our average yield per acre is only 1.28 tons and we rank only 34th in production per acre. It would certainly seem that there must be room for improvement somewhere and there may be some need for the plant breeder. In starting this experiment, in the summer and fall of 1902, select heads of timothy were obtained from numerous growers in various parts of the United States and foreign countries. The seed from these select heads were germinated in the greenhouse and 42 plants from each lot transplanted to plats in the field. These plants were placed in rows 3 feet apart with the plants 3 feet apart in the rows, one individual plant in a place. When these plants had reached an age of two years they were carefully examined and individuals selected which showed in most marked degree the important variations which had been observed. Several plants of each of the following types were chosen: 1. Heaviest yielding plants, as shown by actual weight of product through two seasons. 2. Light yielding plants. 3. Early blooming plants. 4. Late blooming plants. 5. Large leaved plants. 6. Small leaved plants. 7. Fine stemmed plants. 8. Coarse stemmed plants. 9. Long headed types. 10. Short headed types. 11. Many leaved plants. 12. Few leaved plants, etc. The seed of these indiual plants of different types were carefully saved separately and planted in plats in a greenhouse. When the young plants were large enough 36

PHOTO BY FRASER

VARIATION IN HEADS OF TIMOTHY FROM DIFFERENT PLANTS

plants of each kind were transplanted to the field and planted one plant in a place, as in the first planting, the progeny from a certain selected plant being placed together. A careful examination of these progenies shows great variability and yet clearly shows that there is in some instances a tendency in the progeny to inherit the characters for which the mother plant was selected. As an illustration: 7 heavy yielding vigorous plants and 6 light yielding weak plants were selected

and progeny planted in the test plats. In 1906, the product of 251 plants, the offspring of selected vigorous plants, weighed 80.115 pounds or an average of 0.319 pounds per plant. In the same year the product of 132 plants the offspring of selected weak plants weighed 27.723 pounds or an average of 0.210 pounds per plant. This shows clearly the gain in vigor by taking seeds for planting from vigorous plants.

Plants which were selected as early blooming and late blooming types clearly transmitted these characters in considerable degree. While in several cases the characters were transmitted, in general the progenies were very variable and showed little indication of transmitting the characters for which the mother parents were selected. The seed from plants selected and used in the planting was not bagged and the great variation in general showed by the progeny clearly indicates that the seed was largely cross fertilized with pollen from different plants which introduced the characters of other parents. The planting of the progenies of select plants have thus demonstrated two important factors: 1, that certain characters are largely transmitted, and 2, that timothy is in general cross fertilized and that some method of isolation is necessary in the production of fixed races from any valuable variation.

What has been said above in no way indicates the extent of these timothy experiments or their great interest. When the writer took charge of these experiments last July, the plants were in prime condition and in no crop, in any place, has he seen a more extensive planting of experimental breeding stock or a breeding field showing more interesting variations and greater opportunity for making interesting and valuable selections. The fields contained nearly 20,000 individual plants, one plant in a place, planted in rows like corn. We are accustomed to think of timothy as timothy, different varieties or races never having been distinguished or established. In this experimental field however, it would have been easily possible to select out as many as 300 different plants, differing from each other by marked characteristics which could doubtless have been bred into as many stable races or different varieties. The extent of the variation was remarkable. Side by side one would find for instance, one plant past blooming and nearly ripe while the other was just coming into bloom, or one plant with the leaves all ripe and drying up while the other was entirely green and vigorous, or perhaps one plant nearly killed by rust while the next one to it would show scarcely an indication of rust. Some plants are tall, compact and upright and well suited for use as hay varieties which is the ordinary use to which timothy is put, while occasionally a plant is formed which throws a large amount of green foliage at the base, showing a tendency to stool out and spread by vegetative methods of propagation, indicating that they might prove valuable special types to use for pasture purposes. Such variations furnish great opportunities for the breeder and indicate what characters can be obtained in different varieties. From this interesting field the writer selected about 200 plants, possessing valuable characters which will be carefully tested, and some of them, it is hoped, may be bred into new races of superior value. Considering the extent of timothy cultivation in New York, the great value which an improved higher yielding race would have, can be readily understood. All students interested in breeding should be sure to see this breeding field of timothy next June, before leaving for their summer vacations, as a very large number of the original plants will be destroyed after the harvesting of the next season's crop. A plant breeder could well afford to travel across the state of New York just to see this timothy experiment.

A second practical experiment, started under the direction of Professors Hunt and Gilmore, which is being continued under the writer's direction, is on the improvement of

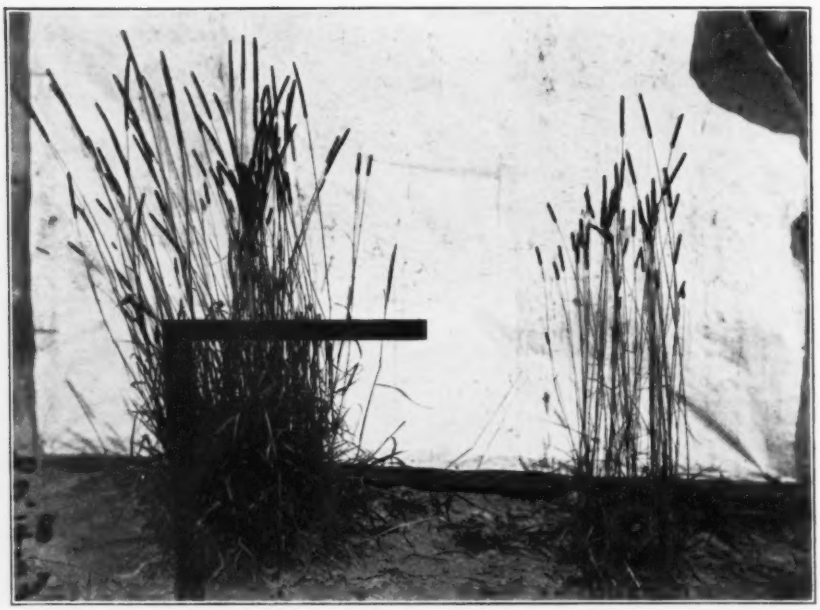


PHOTO BY GILMORE
VARIATIONS IN TWO TIMOTHY PLANTS GROWN SIDE BY SIDE IN FIELD

clovers. In this crop two of the principal improvements desired are increased yield and greater resistance to winter killing. A considerable number of plants representing several different varieties and species of clovers were planted last year, one plant in a place as in the case of the timothy. With reference to winter killing, nature does the selecting and in many cases a considerable number of the plants were killed last winter. Those surviving would naturally be supposed to be the most resistant to winter killing, though this will require further demonstration. The breeding of clovers and other leguminous crops will form one of the important lines of work of the Department.

Careful students of New York Agriculture have come to believe that one of the important problems before the state is to increase the growth of concentrates used for food stock. At present a large percentage of such foods must be purchased by our stockmen from other states. Probably the most feasible way of doing this will be to increase the production of corn grown for grain. If, however, we are to materially increase the growth of corn it is important that we secure varieties that will give better yields under our conditions and at the same time ripen in a shorter period so that it will be more certain to mature before killing freezes come in the fall. Work on this problem was started the present season but under very unfavorable circumstances as the spring was late and good land unavailable. As a result, little advance if any, will be made the present year, unless the season is longer than usual. It is proposed to test all of the best yielding early sorts which can be found and carefully breed several of the varieties which are found to be the best suited for the desired purpose.

Considerable work has also been started in coöperation with the United States Department of Agriculture in the breeding of cereals. This year 165 varieties of hybrid and select oats were grown in small test plats. The

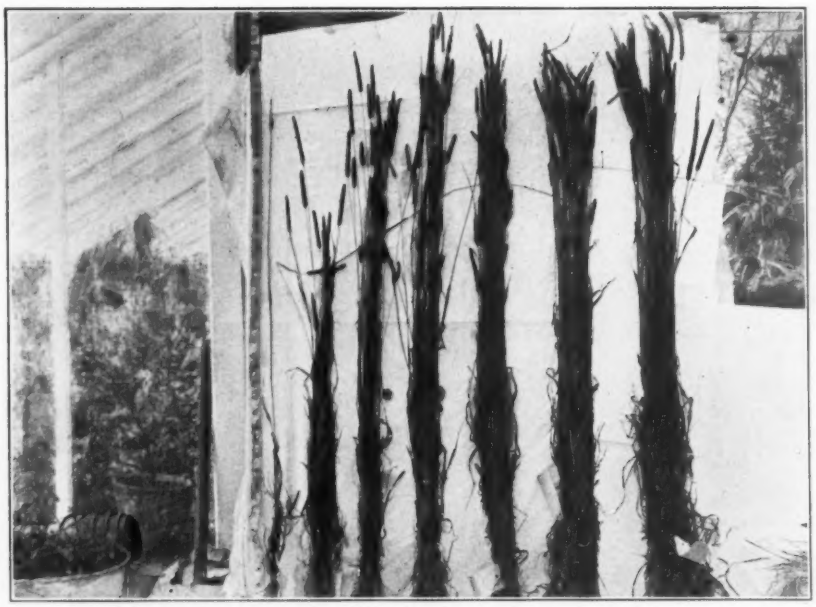


PHOTO BY FRASER

BUNDLES OF TIMOTHY HARVESTED FROM INDIVIDUAL PLANTS OF SAME AGE SHOWING GREAT VARIATION IN YIELD OF DIFFERENT INDIVIDUALS

selections made from these plats will furnish valuable seed to greatly increase the experiments next year. This fall experiments will be started in wheat breeding and the cereal breeding experiments of the Department, it is expected, will ultimately form an important part of the work.

In the various experiments under way the writer will be ably assisted by Assistant Biologist J. B. Norton, who comes from the United States Department of Agriculture, where he has served as Assistant Physiologist for the last six years, Assistant Agronomist O. F. Clark, who has been an assistant in the Cornell Experiment Station for several years, and F. J. Pritchard, who comes to us from the North Dakota Agricultural College, where he has held the position of Assistant Professor of Botany for the last three years.

No field of Agriculture, the writer believes, presents more interesting and important problems for solution than are found in that represented by the Department of Experimental Plant Biology and if the corps of workers engaged in the investigations are able to meet the trust placed with them they should accomplish results worthy of the great institution they represent—Cornell.

THE PEDIGREE

By C. P. Bull

Assistant Professor of Agriculture, University of Minnesota.

WEBSTER defines a pedigree as a lineage or ancestry, or an account or registry of a line of ancestry. Thus people have for many hundred years thought of a pedigree as bearing only on animal biology and have practically disregarded the possibility of there being such a thing as a pedigree in the plant kingdom. Strange as it may seem, there are those people who still hold to the idea that a true pedigree of plants cannot be formed by systematic breeding. The writer is willing to acknowledge that it is an exceedingly difficult matter to perfect a pedigree in open fertilized plants, but for the close fertilized plants bearing hermaphoditic flowers there is nothing easier. Yet on the face of the record, it looks wanting in some way and is hard at first to comprehend because there exists a line of figures showing the existence of one individual only. The difficulty, however, lies with the psycological training of the viewer and not with the exactness of the record ; e. g., with animals we expect in a pedigree to see the names of the two parents, the four grandparents, etc., etc., while with the close fertilized plants we see only the one parent, the one grandparent, the one great grandparent, etc. Hence the seemingly incomplete form of such a pedigree.

To carry the explanation a little further, let us suppose that a certain animal (A) and a certain barley or flax plant (I) have their pedigrees expressed graphically. They would appear something like this :

Animal (A)

- x
  - x'
    - x''''
    - $x(')^2$
  - x^2
    - x^{22}
    - $x(^{22})^2$
- y
  - y'
  - y^2

Thus each side of the family would diverge annually into a larger and larger number of ancestral parents.

Plant (I) $\{(1)' \}(1)'' \{(1)''''$

Thus each ancestral generation would be a single indivdual.

With open fertilized plants, either where the two (male and female) flowers are on the same plant or on separate plants, the working out of a pedigree is a very difficult matter. It can only be worked out, to the same degree of perfection as is done with live stock, by hand work and absolute control of the pedigree stocks. One may easily follow the maternal side of the record, but to know and record the paternal side is the difficult part. For practical purposes one can, by the selection of a number of qualified individuals, (as ears of corn), limit the range of paternal ancestry to a small number and by detasseling or some such control limit it to the several progeny of a single "mother" ear. This, however, is short of the "true" pedigree since but one side of the ancestry is exactly known.

From the plant breeder's point of view a pedigree, with one side known and the other side limited to a small number of selected parents, will be sufficient. Who can tell what the harvest may bring forth with four to ten weeks between fertilization and harvest. In other words, in this particular case, the breeding is a matter of chance in either case and Nature's chance is as safe as the eye of the breeder in selecting the male parent.

If we represent the pedigree of this character in graphical form, it would appear something like the following, if (B) is taken as the pedigree stock.

Plant (B)

- (B) ?
  - (B) ?
  - (B) ?
- (B)'
  - (B) ??
  - (B)"

Thus the male side is not ascertained in any case, as is indicated by (?).

In this case the male in each instance is known as (B) n-? which means that the one which furnished the pollen is some one plant (? equals not known) among many resulting from selected "mothers." Again

$$\text{Plant (B)} \begin{cases} (B)\ n' \\ (B)' \begin{cases} (B)\ n'' \\ (B)'' \end{cases} \end{cases}$$

Thus the male is confined within the limits of the progeny of *one* selected mother, (B) n'.

It is not a difficult problem to form a pedigree. But it is a difficult problem to make a pedigree which bears value. Let us stop for a moment to consider what makes a pedigree valuable. Is it the fact that a certain individual is sired by and is the daughter of this or that one, which in turn have grandparents so and so? Not at all, the value of a pedigree lies in the record, along economic lines, which the individuals have made. The public has too long been imposed upon by the bare record of ancestry. But breeders have awakened to the fact and are now strenuously demanding records.

Never in the history of the world has science, especially as applied to breeding, been so popular and been made the servant of man as today. The work of breeders all over the country is breeding better and more efficient individuals. At the same time the general average of the multitude is rising in value, which, after all, is the only true advance. High class individuals may come and go and accomplish much, but their influence is slight compared with that of the great average.

THE AGRICULTURAL ASSOCIATION

By M. C. Burritt, '08

"RECOGNIZING agriculture as the first and most essential of human pursuits, and its study as one of the fundamental features of Cornell University, and hoping that its future shall evince a marked and continuous improvement on its past; we, the undersigned, in order to extend a correct knowledge of all subjects pertaining to this science and art, to incite a livelier interest in its improvement and to cultivate a clear and lucid expression of our own views, do hereby form ourselves into an association . . to be known as the Greeley Club of the Cornell University." Thus reads the preamble of the constitution of what later became the "Agricultural Association" the oldest society in the University. It was signed in 1877 by twenty-four persons, and minutes of the meetings for thirty years show that the most prominent and successful students of the College have been identified with the Association and active in its work. The programs have nearly always been interesting, instructive and helpful to students attending. It is the testimony of those who have been connected with the College of Agriculture for many years that every movement or interest affecting the student body of the College had its origin in the Association. Illustrations of its activities may be cited in the Agricultural Banquets and the "Honor System."

During the past few years a number of technical clubs, such as the Poultry Association and the Round-up Club besides the Lazy Club have been formed and may have seemed to interfere with the Agricultural Association. These, however, are but the natural outgrowth of our competitive and strenuous life. Each organization has its place and work and one should not interfere with the other. This Association is the more general and represents the College and the student body as a *whole*, while the other clubs represent only important *parts*. The Lazy Club is horticultural and the Round-up Club is concerned with animal husbandry, while the Association's interests extend over the whole field of agricultural knowledge.

Last year in order that the student body might be better represented a board of directors was formed, consisting of a representative from each of the Clubs and two from the Association. This board is the controlling body in student affairs, and no final action may be taken by the Association without its approval.

There are several things which the Association aims to do. The most important are :

I. To represent the students of the College in the University.

II. To transact all business which concerns the students of the College of Agriculture.

III. To give its members practice in speaking and debate and to train them for active practical public work.

IV. To keep in touch with agricultural progress and to second and support all movements toward the betterment of agricultural conditions.

The executive board aims to provide programs which shall be interesting and entertaining while at the same time practically instructive. All who attend the meetings testify to their value. The new student will find no better place to show his interest in the affairs of the College and to make himself useful in its work. Like all other organizations the power and usefulness of the Association depends on the interest and personal initiative of its members. These should, and I am confident will, in the coming year maintain and even surpass the high standard set by those who have preceded us.

THE LAZY CLUB

PERHAPS the most novel and unique organization in the College of Agriculture is the Lazy Club. Contrary to the usual meaning of the title "Lazy Club," this society seems to be bubbling over with energy and enthusiasm despite its Utopian existence. It has no officers, constitution, or dues, but under the veiled guidance of the Horticulture Department, the conduct of the members and their discussions are kept within reasonable limits.

This Club evoluted out of periodic gatherings of the graduate students in a horticultural seminary under the supervision of our present Dean Bailey, who at that time was the head of the Horticulture Department. According to records, the organization first met as a club on the 19th of November, 1896, at which time the late Professor E. G. Lodeman delivered an able discussion on "Begonias." Through the widespread influence of its many members, the Lazy Club is known all over the United States and the World, even unto the Orient.

The Lazy Club meets every Monday evening at 7:30 in the Lazy Club rooms connected with the Forcing Houses. The program starts with a hasty review of the current horticultural and agricultural magazines, of which a goodly number are presented by the publishers or else the subscription is paid by some member. It is almost impossible for every one to peruse all the periodicals, so it devolves upon some person designated at the preceding meeting to read all papers and give a brief resumé of important topics. The principal event of the evening is a discussion of local conditions that surround the several students in their various homes, or else a lecture by a member of the Faculty or some invited guest. This is followed by an informal discussion participated in by all persons present. A basket of fruit or similar treat never fails to secure the appreciation of all, especially the younger members. The evening closes with the signing of the Register, by which act one becomes a member of the Lazy Club.

THE POULTRY ASSOCIATION

By R. C. Lawry, '09

THE Cornell University Poultry Association is a students' organization for the advancement of poultry interests among the agricultural student body.

It was organized in 1904 and held

its first annual Poultry Show in that year. The officers are chosen by ballot from among the members. Any student registered in the College of Agriculture may become a member upon payment of the membership fee of twenty-five cents. The Association holds meetings every two weeks for the transaction of business and the discussion of timely poultry questions. From time to time the discussions take the form of debates, either extemporaneous or prepared. This feature of the meeting is especially valuable since it is at once instructive and entertaining, and affords opportunity for the members to become accustomed to speaking in public.

Often meetings are addressed by non resident speakers or specialists in some one line of poultry work.

It is the custom of the Association to hold at some time during the college year their annual Poultry Show. These poultry shows are conducted under the same business lines as the large poultry shows of the country and afford the members opportunity to acquaint themselves with the methods of poultry show organization and control. The show is conducted entirely by the students and all members may select and prepare and exhibit for prizes, stock from the college plant. The awards of the show are placed by an expert judge who explains the principles of judging and shows by illustrated lectures his reasons for placing the awards as he does.

It is planned to make the week of this year's poultry show, Feb. 17–21, 1908, the largest and most beneficial event in the history of the Association. During the week of the show there will be held at the College a Normal Poultry Conference under the auspices of The New York State Branch of the American Poultry Shows.

Other speakers, specialists in their line, will treat fully the subjects of scoring and judging, utility, commercial egg farming, commercial meat poultry farming, buildings, feeding, incubation, brooding, etc. Among the speakers are to be several ladies so that the woman's side of the question will also be presented.

Every agricultural student interested in Poultry should become an active member of the Association.

THE ROUND UP CLUB

By C. H. VanAuken

Assistant in Animal Husbandry

THE latest organization of the College of Agriculture is the Round Up Club. It consists of students, faculty members and others who realize that animal husbandry has become one of the most important subjects taught in the curriculum of the College of Agriculture.

The students felt the need of an organization where they could meet informally to discuss matters of interest along animal husbandry lines. The Round Up Club was organized March 11, 1907, holding its first meeting in the Dairy Building. It has no officers and no constitution. At every meeting, the record book is signed by each person present, thereby making him a member of the Club. No dues of any kind are charged.

The Club meets every Monday evening at 7:30 in the Animal Husbandry Building. Certain persons are chosen at each preceding meeting, to read the current papers and select items of interest, which are read and discussed at the meeting. Often items of local interest to some member of the organization are brought up at the Club.

To give an idea of the nature of the subjects discussed at these meetings, a few of the topics are herewith given:

"The advisability of the use of thoroughbred sires that were distributed by the American Jockey Club." "The Stock Yards at Buffalo." "A visit to breeding farms and estates near New York City."

At one meeting a debate was held with the Poultry Association on the question, "Resolved that poultry keeping offers better opportunities than cattle breeding."

The Cornell Countryman

H. H. SCHUTZ, Editor
E. L. D. SEYMOUR - Alumni Editor
A. W. McKAY, M. C. BURRITT, E. L. BAKER, W. H. ALDERMAN, - Associate Editors
E. G. McCLOSKEY, - Business Manager
S. F. WILLARD, JR., R. H. DAYTON, G. H. MILLER, - Assistant Managers

OCTOBER, 1907

Foreword

WITH the present number the *Countryman* begins the fifth year of its existence. From a publication of thirty six pages it has gradually evolved into a magazine of about sixty-four pages in its endeavor to carry out the plans of its founders.

In the first number, December, 1903, the editor, Dr. G. F. Warren, stated: "It is not our purpose to enter the field so well filled by the many excellent farm papers, but rather to appeal to the student of agriculture, be his work in farming, teaching or investigation. In the *Cornell Countryman* we hope to voice the best in agricultural training. We will present articles that deal with the larger problems of country life, the economic and social conditions, the rural school and the farm home. The results of scientific investigations and general agricultural news will be given prominence. Special attention will be given to news of former students."

Since the above was written the the policy of the *Countryman* has been to follow along the lines so clearly outlined, and it is the earnest desire of the present Board to get into even closer relations with the alumni, faculty and students and to induce them to make still greater use of the columns of the *Countryman*.

Competitors Wanted

ENTERING students, and any of the old students who care at all for work on college publications, or who think that they may some time drift into editorial duties, are urged to enroll as competitors at the *Countryman* office.

Stone's Scheme

FROM now on students will be called upon to satisfy certain requirements in the way of experience in farm practice before they will be allowed to graduate.

On page 8 Professor Stone sets forth the plan for familiarizing students with the methods and practice of farming without adding to the regular curriculum. The scheme is so simple and practical and supplies such an urgent and important feature in agricultural education that it is surprising that it has not been introduced long ago.

A New Course

ANOTHER department that will appeal to all students, especially upperclassmen and graduates, is that of Methods and Practice in Extension Work mentioned on page 46 of the Program of Instruction.

If there is any one thing that a student needs besides knowledge, it is the ability to clearly and forcibly express what he has learned; and the Faculty, in establishing this course, has added to the opportunities of Cornell students for acquiring one of the

most gratifying of accomplishments —that of thinking while on one's feet.

Charles H. Tuck, who will have charge of this course, while a student, won the Woodford Prize in Oratory, the '86 Memorial Prize in Public Speaking, was president of the Debate Union and Debate Council, and editor of the Era and Cornellian.

Student Organizations

In this issue we have endeavored to give short outlines of the several student organizations, for the benefit of new matriculates as well as for others who may not have enrolled in one or more of these societies. Freshmen cannot be too strongly urged to ally themselves with some form of student activity, for one gains a great deal in being associated with young, studious men who are working along lines identical with those in which one is himself interested.

1907 Graduates

In his speech before the Agricultural Association on the evening of May 7, Dr. Hunt referred to the small proportion of graduates that return to the farm. He said that a student from an agricultural college has his choice of the following openings: farm ownership, farm management, government employ, experiment station work, teaching in agricultural colleges and in secondary schools.

Altho it is still a little too early for last year's graduates to have found what they are best fitted for, yet it is interesting to glance over the Former Student columns and note what they have been doing during their first few months of merited freedom.

State and Farm

Director Bailey's address at Lansing, Michigan, on May 23 on "The State and the Farm" was replete with aphorisms and earnest philosophy. Some of the more striking truisms are given below:

"Abandoned farms are not necessarily to be deplored; rather they are to be looked on as an expression of a social and economic change.

"It is well enough to make great effort to sell the abandoned farms, but it is better to combine this effort with a movement to reorganize farming.

"The future of agriculture in the East lies largely in its diversification.

"The new West is still in the epoch of self-congratulation, and a man who criticises or who gives some other state or community the credit of more tons of produce is subject to popular disapproval. The East has reached a point when it is willing to look the facts squarely in the face.

"The nativeness of rural institutions has been allowed to die out, and the country has been left socially sterilized.

"We have been living in an epoch of city development, with no adequate means of redistributing or returning the energy to the regions of its origin.

"Society can be saved and advanced only by increasing the number of competent persons who stand on their own feet.

"Consolidation or centralization of power is a necessity. Yet at the same time we are pressed by the necessity of maintaining initiative and vitality.

"The great rural movement of the future is to be the evolving of a new social economy.

"One of the commonest causes of discouragement in a farming business

arises from this failure to utilize local or neighborhood experience.

"Our present greatest need is the development of what may be called "the community sense"—the idea of the community, as a whole, working together toward one result.

"The best model farms are actual farmers' farms.

"Agricultural education is in need of measuring and coördinating with education in general.

"Without the country there would be no city; without the city there would still be land.

"Our banking systems are devised for the handlers of money, whereas some of them, at least, should be devised for the workers and common users.

"Perhaps it is not too much to say that the public schools do not yet teach the essentials. The first object of any school should be to teach people how to live.

"By every legitimate means we should develop and fix local attachments.

"The real and lasting progress is to be made by those localities that first fundamentally redirect the existing schools in the interest of all the people.

"We are now interesting the child in the earth on which he stands, and as his mind grows we take him out to the larger view.

"The problem of the rural school is not so much one of subjects as of methods of teaching.

"Education is not confined to the institutions known as schools. It is the result of all experience and all training.

"The fairs are one of the anomalies of the present time. The fair should be a kind of school, and its work and influence should exist continuously throughout the year.

"There is no greater field for service than in the country church; but the pastor should have had a course in an agricultural school as well as in a theological seminary.

"I have tried to show that the rural country needs a new direction of effort; a new outlook, and a new inspiration."

GENERAL AGRICULTURAL NEWS

The new State School of Agriculture at St. Lawrence University, opened its doors to students during the month with the object to make all instruction as practical as possible. Special emphasis is to be laid on coöperation with farm, shop, dairy and home, and on teaching the pupils to properly appreciate, and to get the most out of, a healthy life on the farm. The Dean, Dr. K. C. Davis, '91 B. S., '94 M. S., Kansas Agricultural College received his doctorate at Cornell in 1900. Until 1902 he was professor of horticulture at the University of West Virginia, and then became principal of the Dunn County School of Agriculture, Menominee, Wis.

* * *

Three bulletins were issued by the College during the summer, two being by the poultry department on "A Gasoline-heated Colony Brooder-house" and "New Poultry Appliances," and the other by Dr. Hunt on "The Importance of Nitrogen in the Growth of Plants."

* * *

Many of the College faculty attended the celebration of the twenty-fifth anniversary of the founding of the Geneva Experiment Station last August. Director Bailey made one of the main addresses. The celebration was preceded by a meeting of the Fruit Growers' Association, Dr. Webber delivering an address.

The fifteenth National Irrigation Congress was held at Sacramento, California, between Septemper 2 and 7. The objects of the organization are to preserve the forests, utilize the flood-waters, reclaim the deserts and settle people on the land.

* * *

The Association of American Agricultural Colleges and Experiment Stations met at Lansing, Michigan, at the time of the semi-centennial of the Michigan Agricultural College. Director Bailey's presidential address has been issued in pamphlet form. Some thirty-five presidents and directors of universities and scientific schools were present at the celebration, and President Roosevelt and Secretary Wilson were included among the speakers. The degree of Doctor of Laws was conferred upon Director Bailey.

* * *

In the Michigan Agricultural College instruction is given in dressing beef, pork, mutton and poultry, each student being required to dress several fowls and a steer, hog and sheep. They are also taught to cure and to divide the carcasses for table use. Simple methods are used and the farm boys become proficient in slaughtering and dressing.

* * *

The restrictions on the sale, manufacture and storage of denatured alcohol were materially improved September 1st, and with a decrease in cost its use will no doubt be greatly extended.

* * *

The State Department of Agriculture is making efforts to divert Scandinavian immigration to this state and has agents abroad and in New York who set forth the advantages of remaining in the state.

* * *

The Farmers' National Congress will be held in Oklahoma City, Okla., this year. It is to have its first session on October 17.

Seedless fruits may now be obtained by moistening the stigmas with a liquid compounded by Dr. R. Ewart of Proskau Pomological Institute. The liquid prevents the germination of the pollen on the stigma and the ovary develops through parthenocarpy, or virgin fertility. His best results were secured with the pear and apple.

CAMPUS NOTES

The exhibition of the College of Agriculture at the State Fair this year was entirely different from that of former years. A large hall was provided with a lantern and at intervals every day views of Cornell and the work of the College were shown. First, a short general talk was given, and then each of the departments of the College gave a brief exposition of its work and the methods used in teaching and investigation. The department of plant pathology also displayed its instructive exhibit of plant diseases.

* * *

Work has begun on the new greenhouses for the departments of Professors Lyon and Webber. They are being placed east of the College and are to be used for work in plant evolution and experimentation. These two houses, measuring 60x28 feet, are but the beginning of the covered area that will be required as the departments develop.

* * *

Last July some 150 members of the Batavia Grange came to Cornell for a day's recreation. Prof. Pearson, as usual, was in charge of the reception and entertainment.

* * *

Prof. Wetzel has a plant disease garden east of the Athletic Field devoted to the study of this important subject. It is to be divided into small plots for illustrating the treatment of diseases and experimental purposes.

Near the disease plats, Dr. Duggar will have a tract for experimental plant physiology.

Dr. Warren and Dr. Webber will use the old alfalfa field for their experimental work.

* * *

Prof. Judson spent part of the summer in Niagara County studying the effects of Little Peach, Yellows and winter killing. He also visited the truck regions of Long Island with a view to starting a truck survey similar to the orchard survey.

* * *

It is generally regretted that Prof. J. W. Gilmore is to leave the College after the several useful years he has spent in the agronomy department. He goes to join Dr. Hunt at the Pennsylvania State College and assumes charge of the agronomy department there with the rank of professor. Prof. Gilmore's absence will be severely felt by those who were in the habit of calling on his extremely wide and apparently inexhaustible store of information.

* * *

Benjamin M. Duggar, M. S., A. M., Ph. D., formerly assistant cryptogamic botanist here, now professor of botany at the University of Missouri, and one of the foremost botanists of the country has been appointed professor of plant physiology in its relations with agriculture. Professor Duggar is not expected before the beginning of the second term.

* * *

Assistant Professors Stone and Rice have been advanced to full professorships. Prof. Rice continues in charge of the poultry department, while Prof. Stone assumes supervision of the newly modified department of farm practice.

* * *

Charles S. Wilcox, Charles H. Tuck, Bryant Fleming and Merritt W. Harper have been advanced to assistant professorships.

Leon D. Batchelor, B. S., has been made assistant in horticulture.

* * *

Donald Reddick, B. A., has left the botany department to become assistant in plant pathology.

* * *

William C. Baker, B. S. A., is assistant professor in charge of the new department of applied drawing.

* * *

Howard W. Riley, M. E., gives the course in farm mechanics this year. It is now a department by itself.

* * *

Assistant Professor Warren, Ph. D., and instructor Paul J. White, A. B., M. S. A., have been given charge of the department of farm crops, one of the parts into which last year's agronomy department has been divided.

* * *

Gilbert A. Renny, formerly of the Co-op, has been appointed superintendent of mailing rooms.

* * *

Miss Flora Rose has been appointed lecturer in home economics and to the supervision of the college work in this course.

* * *

Clarence A. Rogers, M. S. A., and Miss Clara Nixon have been made instructor and assistant, respectively, in the poultry department.

* * *

Miss Minnie Jenkins, B. S. A., is assistant in dairy bacteriology this year; and Allen Ferguson, Wesleyan University '05, in cheese-making.

* * *

Jesse B. Norton, M. S., assistant biologist in the experiment station, comes to Cornell from the Department at Washington to assist Dr. Webber in plant breeding. He has been working with oats and potatoes, and has given the scientific principles of breeding a great deal of attention.

F. J. Pritchard, assistant professor of botany in the North Dakota Agricultural College, is here to do special plant breeding work in coöperation with Washington. He is registered for a doctorate under Dr. Webber.

* * *

Prof. S. M. Babcock, of Wisconsin, visited the College in September and expressed gratification with our equipment for instruction in dairying and in the use of the test that bears his name.

* * *

The dairy department offers a course in dairy mechanics for the first time this year. It is given by H. L. Ayers.

* * *

A one-year course in poultry husbandry has been arranged to satisfy those who wish to fit themselves for practical poultry raising.

FORMER STUDENTS

COURTESY OF THE CHURCH HELPER

MILTON M. UNDERDOWN

'02, M. S. A.—Milton M. Underdown died of yellow fever August 13, 1907, in one of the interior towns of Brazil. He was born thirty-one years ago at Willow Creek, N. Y. After graduation he went to Sao Paulo, Brazil, to become director of the model plantation of the school of agriculture at Piracicaba, and on his return home, June, 1904, was married to Miss Josephine Prince, of Keating Summit, Pa., formerly a student in the Ithaca Conservatory of Music. Mrs. Underdown and their two children were about to join him in Brazil when news came of his death. Before his second trip to Brazil he developed the lands of the Queens Water Company at Far Rockaway, and was manager of the model farm at Sangerfield.

As a student, Mr. Underdown was prominent as a member of the Agricultural Association, Alpha Zeta, and the Andrew D. White Debate Club, also on the '86 and '94 Memorial stages.

'06, B. S. A.—David A. A. Durward was drowned in the Connecticut river near the Mount Hermon School for Boys on July 2. In company with another instructor, N. K. Green, he was canoeing in the river, when, in attempting to turn, the canoe was capsized by the ebbing tide and before

D. A. A. DURWARD

help could reach them both were drowned. He was born in Scotland in 1881, obtained his early education at Claremont, N. H., and entered Cornell from the N. H. State Agricultural College. At Mount Hermon he was in charge of agriculture and nature study.

'07, Ph D.—J. E. Coit was married on August 7 to Miss Emilie A. Hanna, of Raleigh, N. C., and is now located at Tucson, Arizona. As associate horticulturist he has charge of the date, olive and citrous work of the Experiment Station. While a student here, Mr. Coit was editor of the *Countryman*, assistant in horticulture and fellow in agriculture.

'05, M. S. A.—Charles S. Wilson, whose engagement to Miss Ada L. Miller, Vassar '06, was announced last April, was married in Ithaca on Sept. 4. Following the ceremony at the church, a reception was given at the home of the bride's parents on Albany street, after which Mr. and Mrs. Wilson left for a trip to the principal cities of the East. Prof. Wilson was the second editor of the *Countryman*, president of the Agricultural Association, and is now assistant professor of horticulture and president of the Ontario County Fruit Growers' Association.

'06, B. S. A.—At a recent meeting of the "Sociedad Nacional de Agricultura del Peru," Antenor Valladares, M. E. '06, and C. Bües, B. S. A. '06, were elected consulting "Ingenieros Agrónomos"; Mr. Valladares in electricity, Mr. Bües in entomology.

'06, B. S. A.—A. S. Coelho has been appointed by the state of Sao Paolo, Brazil, to report on the rubber of the manicoba tree, also on methods of cultivation, combating insect enemies, and refining the products.

'07, Ph. D.—Miss Philena B. Fletcher, '04, B. S. A., '07 Ph. D., was married to William H. Homer, Jr., '00 B. S., Utah, '06 M. S. A., Cornell. After the wedding Mr. and Mrs. Homer left for the West and are now in Provo, Utah. Mrs. Homer received the Guilford prize in 1903, and besides attending to her regular work in college, she was librarian in the Veterinary College, associate editor on the *Countryman*, and had charge of the agricultural columns of the Ithaca News. The bridegroom is manager of a fruit farm and professor in horticulture in the Brigham Young university.

'07, M. S. A.—J. N. Chakravarty traveled in the South studying tobacco, and returns home in October for college work in agriculture.

'07, M S. A.—H. S. Datt and S. N. Sil traveled in the South and West and Canada and return to India in the fall to assume government positions.

'07, M. S. A.—C. F. Clark, is assistant agronomist under Dr. Webber.

'07, M. S. A.—A. E. Ghosh spent summer in the West and Canada, and returns to India to teach.

'07, M. S. A.—C. F. Kinman, is assistant horticulturist at the Cuba Experiment Station.

'07, M. S. A.—R. Matheson is state entomologist in South Dakota.

'07, M. S. A.—O. S. Morgan is assistant in horticulture at Pennsylvania State College.

'07, B. S. A.—F. Aleman spent the summer traveling in Europe and expects to return to Argentina.

'07, B. S. A.—S. F. Ayer is in the dairy department at Hampton Institute, Va.

'07, B. S. A.—E. W. Cleeves is manager of a farm in St. Lawrence Co.

'07, B. S. A.—G. D. Cooper is engaged in landscape gardening in the West.

'07, B. S. A.—D. G. Dragoshinoff spent the summer getting farm experience and will return to Bulgaria.

'07, B. S. A.—G. G. Burlingame has returned to the farm.

'07, B. S. A.—J. Goldhaar went to Kansas and other western states for farm experience.

'07, B. S. A.—H. B. Grubb and N. H. Grubb worked at landscape gardening and are to return to Cornell.

'07, B. S. A.—Miss M. Gunnison has started her farm in Pennsylvania.

'07, B. S. A.—A. G. Hammar is assistant in zoology.

'07, B. S. A.—Miss M. Jenkins was here all summer and has been appointed assistant in dairy bacteriology.

'07, B. S. A.—Miss B. Kleniewska has returned to Poland.

'07, B. S. A.—E. W. Leland worked on College farms all summer and will take graduate work this year.

'07, B. S. A.—H. F. Prince has settled on a ranch in Colorado.

'07. B. S. A.—W. J. Morse is in Washington, D. C., in charge of the grass work on the Arlington farm.

'07, B. S. A.—S. H. Perky remained in Ithaca and will take graduate work this fall.

'07, B. S. A.—H. C. Pierce has gone to Ames, Iowa as instructor in poultry husbandry.

'07, B. S. A.—H. H. Schutz traveled during the summer and returns to Texas to start his farm.

'07, B. S. A.—J. B. Shepard is manager of a farm near Philadelphia.

'07, B. S. A.—C. B. Tillson is manager of the Sanger farm at Sangerfield.

'07, B. S. A.—Y. H. Tong spent the summer at Crowley, La., studying rice and rice irrigation, and will do graduate work in in the South before returning to China.